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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,563	01/02/2002	Masahiro Ishida	740819-723	5817

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EXAMINER

MALDONADO, JULIO J

ART UNIT PAPER NUMBER

2823

DATE MAILED: 11/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/032,563

Applicant(s)

ISHIDA, MASAHIRO

Examiner

Julio J. Maldonado

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-8 is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The non-final rejection as set forth in paper No.6 is withdrawn in response to applicants' amendments.
2. A new 103(a) rejection is made as set forth in this Office Action.
3. Claims 1-8 are pending in the application.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asai et al. ('519) in view of Cook ('078).

Asai et al. (Figs.3-5) in a related method to form an epitaxial grown substrate teach a first step of selectively forming a raised and recessed region in the upper portion of a base substrate (21); and a second step of growing a semiconductor layer of nitride (26) on said raised and recessed region in said upper portion of said base substrate (21) so that a recessed portion in said raised and recessed region is filled and the upper surface thereof is even (column 4, line 5 – column 5, line 32).

Asai et al. fail to teach a third step of irradiating an interface between said semiconductor layer and said base substrate with a laser beam, thereby separating said semiconductor layer from said based substrate to form a semiconductor substrate from said semiconductor layer. However, Cook (Figs.1-2) in a related method to form a

single crystal semiconductor film teaches a step of irradiating an interface between a semiconductor layer (13) and a base substrate (11) with a laser beam (19), thereby separating said semiconductor layer (13) from said based substrate (11) to form a semiconductor substrate from said semiconductor layer (13) (column 2, line 38 – column 4, line 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use a laser beam as taught by Cook in the substrate formation method of Asai et al., since this would separate the formed semiconductor layer from the base substrate without destroying the structural integrity of the film (Column 2, lines 2 – 9).

In reference to claim 2, the combined method of Asai et al. and Cook teach in said third step, irradiating the laser beam upon at least a raised portion in said raised and recessed region.

Allowable Subject Matter

6. Claims 3-8 are allowed:

7. The following is a statement of reasons for the indication of allowable subject matter:

Asai et al. (Figs.3-5) in a related method to form an epitaxial grown substrate teach a first step of selectively forming a raised and recessed region in the upper portion of a base substrate (21); and a second step of growing a semiconductor layer of nitride (26) on said raised and recessed region in said upper portion of said base substrate (21) so that a recessed portion in said raised and recessed region is filled and the upper surface thereof is even (column 4, line 5 – column 5, line 32).

However, Asai et al. neither teach nor suggest a third step of irradiating an interface between said semiconductor layer and said base substrate with a laser beam, thereby separating said semiconductor layer from said based substrate to form a semiconductor substrate from said semiconductor layer, wherein said third step, the laser beam is irradiated upon at least a raised portion in said irregular region while scanning along raised portions surrounded by said plurality of grooves in said base substrate; the area occupied by the recessed portions is about in the range from about 1/5 to about 100 times the area occupied by the raised portions; and applying the laser beam from the surface opposite to the main surface of said base substrate.

Cook (Figs.1-2) teaches a method to form a semiconductor substrate in including the step of applying a laser beam along an interface between a semiconductor layer and a base substrate (column 2, line 38 – column 4, line 4). However, Cook neither teaches nor suggests a step of irradiating an interface between said semiconductor layer and said base substrate with a laser beam, thereby separating said semiconductor layer from said based substrate to form a semiconductor substrate from said semiconductor layer, wherein said third step, the laser beam is irradiated upon at least a raised portion in said irregular region while scanning along raised portions surrounded by said plurality of grooves in said base substrate; the area occupied by the recessed portions is about in the range from about 1/5 to about 100 times the area occupied by the raised portions; and applying the laser beam from the surface opposite to the main surface of said base substrate.

Response to Arguments

8. Applicant's arguments with respect to claims 1 and 2 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Papers related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 305-3432**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Art Unit: 2823

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Julio J. Maldonado** at **(703) 306-0098** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via julio.maldonado@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

Julio J. Maldonado

Patent Examiner

Art Unit 2823

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